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Wilkinson

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(54) **STUFFING BOX MAINTENANCE DEVICE**

(76) Inventor: **Jack Wilkinson**, North Zulch, TX (US)

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A47G 29/00 (2006.01)
A47K 1/00 (2006.01)

(52) **U.S. Cl.** **248/218.4**; 248/219.4

(58) **Field of Classification Search** 248/218.4, 248/219.4, 217.3, 222.14, 230.1, 230.9, 217.4, 248/229.16; 211/70.6, 71.01, 86.01
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,133,643 A * 5/1964 Lester 211/116

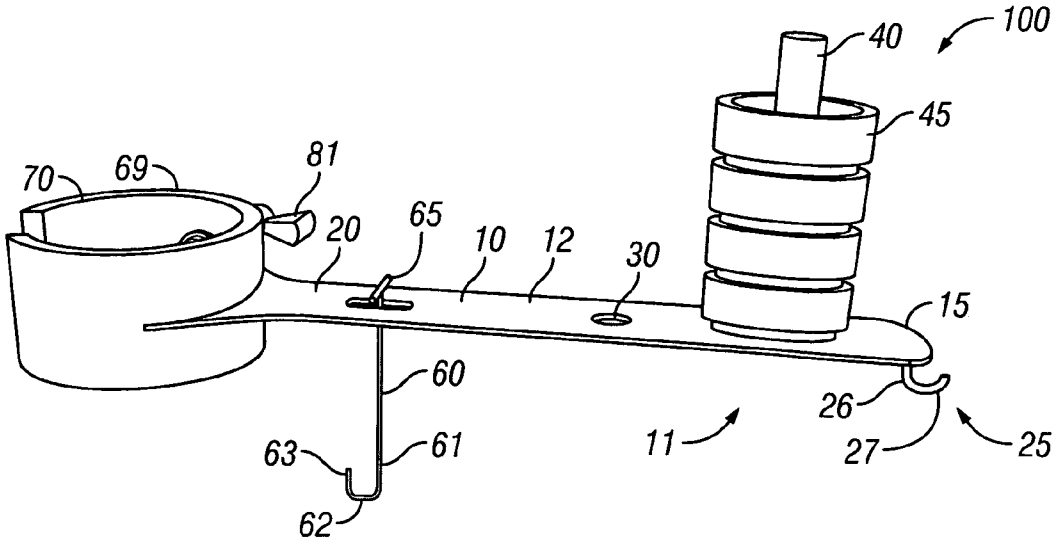
* cited by examiner

Primary Examiner — Amy J Sterling
(74) *Attorney, Agent, or Firm* — Stephen Powers

(57) **ABSTRACT**

A stuffing box maintenance device designed to be releasably secured to a polished rod above the stuffing box wherein the stuffing box maintenance device is configured to retain the tools and the maintenance items required to perform a maintenance procedure on the stuffing box. The stuffing box maintenance device further includes a body being planar in manner and rectangular in shape. A mounting ring secured to the body on one end is operable to surroundably mount the polished rod. An opening is located on the mounting ring opposite the body and is configured to allow the stuffing box maintenance device to be laterally coupled to the polished rod. The stuffing box maintenance device further includes a support rod for retaining at least one packing gland. The body is further configured to retain the hand tools necessary to perform a maintenance procedure on the stuffing box.

16 Claims, 2 Drawing Sheets



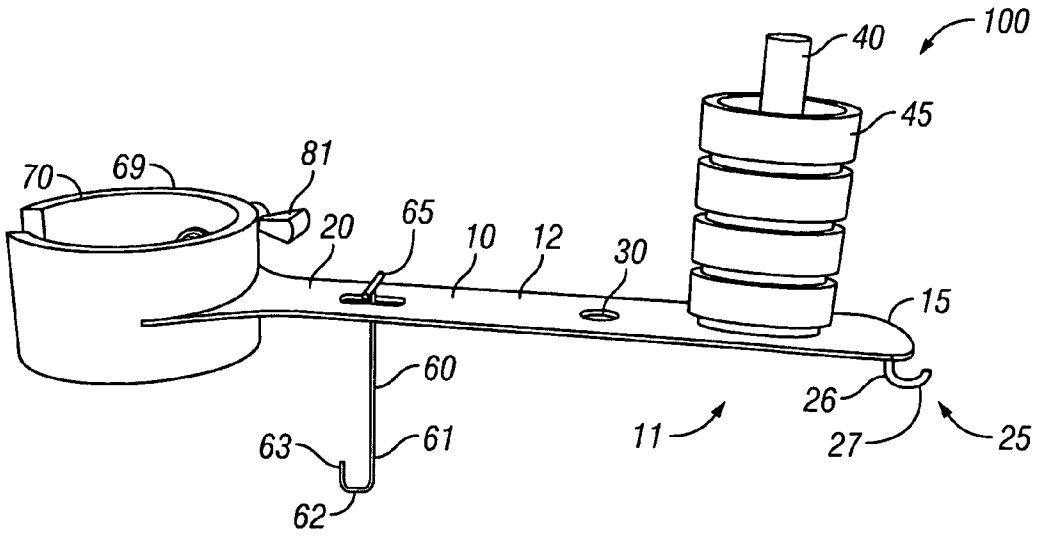

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FIG. 1

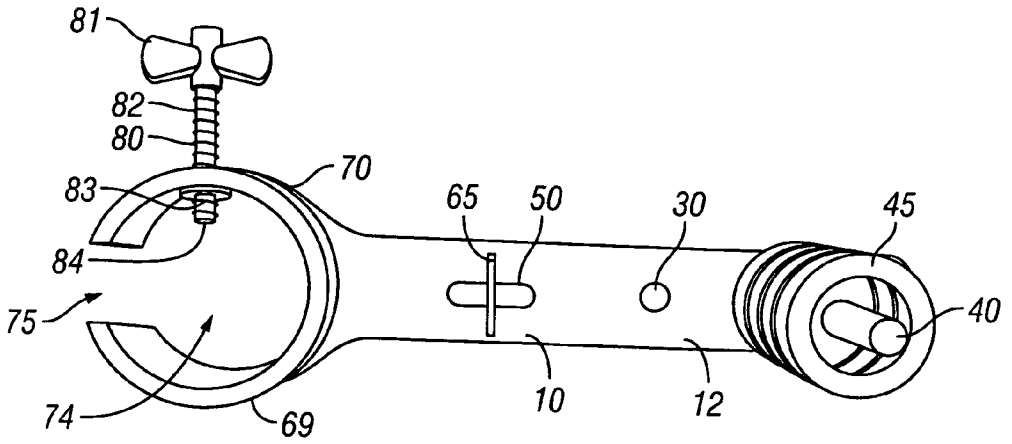
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FIG. 2

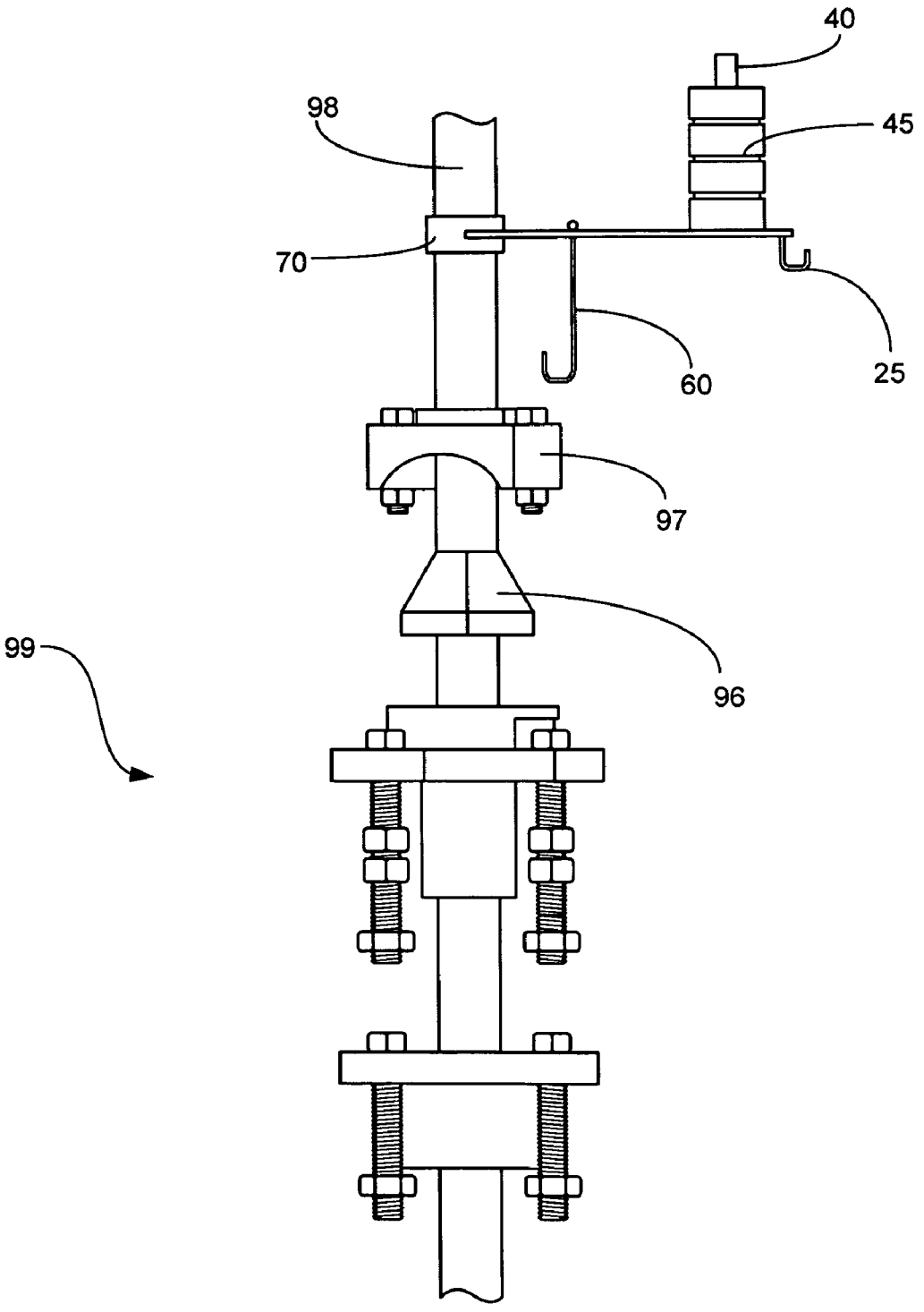

FIG. 3

STUFFING BOX MAINTENANCE DEVICE

FIELD OF THE INVENTION

The present invention relates to a stuffing box maintenance device, more specifically but not by way a limitation, a device design to temporarily suspend the gland cap and other elements of a disassembled oilfield stuffing box engaged with a polished rod oriented in a vertical position to allow an individual to replenish the packing within the stuffing box.

BACKGROUND

Crude oil is typically pumped from underground well or reservoirs utilizing mechanical devices such as but not limited to pumping units. The pumping units power a string of reciprocating sucker rods that extend beneath the ground and are operably coupled to a subsurface pump. The sucker rod string has an integral part thereof a polished rod section, which moves through a dynamic sealing assembly commonly referred to as a stuffing box. The stuffing box is typically located at the well head.

The stuffing box creates a seal with the reciprocating polished rod to prevent the well bore fluids from being vented to atmosphere. Typically, the stuffing box is lubricated to ease the movement of the polished rod through the stuffing box. The lubrication further functions to prevent wear on the seals used to provide the sliding packoff with the polished rod. The lubrication is often referred to as packing and is available in different shapes such as dome or cone shaped.

Routine maintenance requires the lubrication packing be routinely changed within the stuffing box so as to prevent damage to the polished rod. The polished rod is usually in a substantially vertical position with the stuffing box surroundably mounted thereto. An oilfield worker will have to at least partially disassemble the stuffing box to remove the old packing and replace with new packing material. During the performance of this task, the oilfield worker usually removes at least a portion of the stuffing box commonly referred to as a gland cap. The gland cap is surroundably mounted to the polished rod and is moved in an upward direction along the polished rod to allow the user to access the packing material disposed within the stuffing box. One problem that exists during this maintenance procedure is that the worker has no method to retain the gland cap in a suspended position above the stuffing box on the polished rod. The oilfield worker usually must request the assistance of helper to hold the gland cap up and away from the stuffing box so that the oilfield working can access the packing material without interference from the gland cap. This process requires additional labor, which can be costly in a production environment.

Another issue involved in the changing of the packing material of the stuffing box is that the oilfield worker typically does not have a method of holding the required tools to perform the maintenance and perform the task at the same time. Oilfield workers typically utilize an adjustable wrench and a screwdriver or similar tool to remove the gland cap and the packing material. The oilfield will often struggle to perform the maintenance on the stuffing box without dropping their tools.

Accordingly, there is a need for a device that can releasably secure a gland cap surroundably mounted to a polished rod in a position that is above the stuffing box to allow an oilfield worker to access the stuffing box to change the packing material without being inhibited by a gland cap sliding down the polished rod. Additionally, the device should further include a method of holding and organizing the required tools to perform the maintenance of the stuffing box as well as new packing material.

SUMMARY OF THE INVENTION

It is the object of the present invention to provide a device that assists in the maintenance procedures of an oilfield stuffing box operably coupled to a polished rod that can be releasably secured to the polished rod in a position generally above the stuffing box.

Another object of the present invention is to provide a maintenance procedure assistance device for a stuffing box that is operably coupled to a polished rod that has a portion thereof configured to engage with at least the gland cap of the stuffing box subsequent its removal from the stuffing box.

A further object of the present invention is to provide a maintenance procedure assistance device for a stuffing box that is further configured to hold a plurality of packing cones or domes to be installed in the stuffing box.

An additional object of the present invention is to provide a maintenance procedure assistance device that is configured to store and make available for use hand tools that are typically required to perform maintenance on the stuffing box.

Yet another object of the present invention is to provide a maintenance procedure assistance device that is configured to be operably coupled to the polished rod that will not damage the surface of the polished rod.

Still another object of the present invention is to provide a maintenance procedure assistance device designed to facilitate the routine maintenance of a stuffing box wherein the procedure only requires one person.

Another object of the present invention is to provide a maintenance procedure assistance device that can be laterally coupled with a polished rod.

To the accomplishment of the above and related objects the present invention may be embodied in the form illustrated in the accompanying drawings. Attention is called to the fact that the drawings are illustrative only. Variations are contemplated as being a part of the present invention, limited only by the scope of the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

A more complete understanding of the present invention may be had by reference to the following Detailed Description and appended claims when taken in conjunction with the accompanying Drawings wherein:

FIG. **1** is a perspective view of the preferred embodiment of the present invention; and

FIG. **2** is a top view of the preferred embodiment of the present invention; and

FIG. **3** is the preferred embodiment of the present invention operably engaged with a polished rod superimposed a stuffing box.

DETAILED DESCRIPTION

Referring now to the drawings submitted herewith, wherein various elements depicted therein are not necessarily drawn to scale and wherein through the views and figures like elements are referenced with identical reference numerals, there is illustrated a stuffing box maintenance procedure assistance device **100** constructed according to the principles of the present invention.

Referring in particular to FIG. **1** is a stuffing box maintenance procedure assistance device **100** that further includes a

body **10** that is generally planar in manner and rectangular in shape. The body **10** is manufactured from a suitable durable rigid material such as but not limited to steel or aluminum. The body **10** has a first end **15** and a second end **20**. While no particular length of the body **10** is required, good results have been achieved with a body **10** that is about twelve inches in length.

Proximate the first end of the body **10** is a keeper **25**. The keeper **25** is mounted utilizing suitable durable methods such as welding to the bottom **11** of the body **10**. The keeper **25** has a first portion **26** that extends downward from the bottom **11** of the body **10** in a generally perpendicular manner. Contiguous with the first portion **26** is the second portion **27** wherein the second portion is generally arcuate in shape. The keeper **25** functions to releasably receive a tool having an aperture bored through its handle such as but not limited to a conventional crescent wrench. As is known in the art many hand tools, such as but not limited to adjustable crescent wrenches, have an aperture journaled through an end of their handle so as to be stored on devices such as peg boards. The keeper **25** functions to releasably retain an adjustable crescent wrench proximate the area in which the user is performing maintenance on a stuffing box. Those skilled in the art should recognize that the keeper **25** could be manufactured in numerous different shapes and still achieve the desired function as described herein.

Mounted proximate the first end **15** on the body **10** is the support rod **40**. The support rod **40** is mounted on the upper surface **12** of the body **10** and extends in a generally upward direction and relatively perpendicular to the body **10**. The support rod **40** is generally cylindrical in shape and is manufactured from a suitable durable material such as but not limited to steel or aluminum. While no particular length of the support rod **40** is required, good results have been achieved utilizing a support rod **40** that is approximately five inches in length. Additionally, while no particular diameter of the support rod **40** is required, good results have been achieved with a support rod **40** that is approximately three-quarter of an inch in diameter. The support rod **40** functions to receive thereon a plurality of packing glands **45**. Packing glands **45** are routinely replaced during maintenance of a stuffing box **99**, a disassembled version of a stuffing box **99** being illustrated herein in FIG. **3**. Packing glands **45** are typically dome or cone shaped having an aperture centrally located so as to be surroundably mounted around a polished rod **98**. It is contemplated within the scope of the present invention that the support rod **40** could be configured to receive as few as one packing gland **45** or a plurality thereof.

Journaled through the body **10** is an aperture **30**. The aperture **30** is located adjacent the support rod **40** opposite the first end **15**. The aperture **30** is generally annular in shape and functions to receive therein and releasably retain a hand tool such as but not limited to a screwdriver. As is known in the art, screwdrivers are routinely utilized to remove packing glands **45** during maintenance of the stuffing box **99**. It is contemplated within the scope of the preset invention that the aperture **30** could be manufactured in numerous different sizes to accommodate a plurality of different size screwdrivers therein. It should be recognized by those skilled in the art that numerous different types of tools could be releasably retained by the aperture **30**.

Located on the body **10** proximate the second end **20** is a slot **50**. The slot **50** is bored through the body **10** utilizing suitable methods and is generally oval in shape. While no particular size is required, good results have been achieved utilizing a slot **50** that is approximately one to two inches in length. The slot **50** is shaped in the manner illustrated so as to allow the hook **60** to move in a lateral direction along the body **10**. The hook **60** is disposed within the slot **50** and extends in a generally downward direction. The hook **60** further includes a top retainer **65** that is configured to engage the upper surface **12** of the body **10** in order to inhibit the hook **60** from being completely journaled through the slot **65**. The hook **60** is manufactured from a suitable durable material such as but not limited to metal bar. The hook **60** includes a first member **61** that extends downward from the body **10** in a generally perpendicular manner. Contiguous with the first member **61** opposite the top retainer **65** is a second member **62**. The second member **62** is mounted to the first member **61** in a generally perpendicular manner. Contiguous with the second member **62** is a third member **63**. The third member **63** of the hook **60** extends in a generally upward direction. The first member **61**, second member **62** and third member **63** of the hook **60** form a j-shape that functions to engage a packing gland **45** or gland cap **97** of the stuffing box **99** during maintenance procedures. The third member **63** extends upward approximately three-quarters of an inch from the second member **62**. It is contemplated within the scope of the present invention that while in its preferred embodiment the third member **63** extends upward approximately three-quarters of an inch that the third member **63** could be manufactured in numerous different lengths.

Integrally mounted to the body **10** proximate the second end **20** is a mounting ring **70**. The mounting ring **70** is constructed of a wall **69** that is formed in a generally annular shape. The mounting ring **70** is secured to the body **10** utilizing suitable durable methods such as but not limited too welding. The mounting ring **70** functions to surroundably mount the polished rod **98** with which the stuffing box is operably engaged. While no particular size is required for the mounting ring **70**, good results have been achieved utilizing a mounting ring **70** that is approximately two inches in diameter. The mounting ring **70** further has an opening **75** operably couple to a polished rod **98** in a generally lateral direction. The opening **75** allows the mounting ring **70** to be surroundably positioned around the polished rod **98** as typically the polished rod **98** does not have an accessible end. While no particular size of opening **75** is required, good results have been achieved utilizing an opening **75** that is at least slightly greater than one and a quarter inches to one and a half inches in width so as to accommodate a conventional sized polished rod **98** of approximately equivalent diameters.

The mounting ring **70** has rotatably mounted thereto a fastener **80**. The fastener **80** functions to releasably secured the stuffing box maintenance procedure assistance device **100** to the polished rod **98** in a position that is above the stuffing box **99** as shown in particular in FIG. **3**. The fastener **80** is manufactured utilizing conventional material such as a threaded bolt or screw. Mounted to the first end **82** of the fastener **80** is a handle **81**. The handle **81** functions to allow the user to engage the fastener **80** and rotate the fastener such that the fastener **80** protrudes into the mounting ring **70** and engages the polished rod **98**. While the handle **81** is shown in the drawings submitted herewith as being configured in a wing-nut style manner, it is contemplated within the scope of the present invention that the handle could be manufactured in numerous different shapes. The second end **83** of the fastener **80** protrudes into the orifice **74** of the mounting ring **74**. Proximate the second end **83** of the fastener **80** is a tip **84**. The tip **84** is manufactured of a material such as but not limited to plastic or Teflon. The tip **84** functions to engage the polished rod **98** present in the orifice **74** of the mounting ring **70** and substantially inhibit any scarring or scratching of the surface of the polished rod **98**.

While the stuffing box maintenance procedure assistance device **100** has been discussed herein in a preferred embodiment, it is contemplated within the scope of the present invention that the stuffing box maintenance procedure assistance device **100** could be utilized to assist a user perform maintenance in any area where a cylindrical or rod shaped object is proximate thereto in order to allow the stuffing box maintenance procedure assistance device to be coupled to and provide a user tools and maintenance items needed.

A description of the operation of the stuffing box maintenance procedure assistance device **100** is as follows. Referring in particular to FIG. **3**, in use, the user will place the stuffing box maintenance procedure assistance device **100** adjacent to the polished rod **98** and generally above the stuffing box **99** for which maintenance is required such as but not limited too replacement of the packing glands **45**. The user journals the polished rod **98** through the opening **75** and into the orifice **74** of the mounting ring **70**. The fastener **80** is rotated such that the tip **84** engages the polished rod **98** with sufficient force so as to releasably secure the stuffing box maintenance procedure assistance device **100** to the polished rod **98** above the stuffing box **99**. The user may utilize the keeper **25** and aperture **30** to store any tools required to disassemble the stuffing box **99**. The user then places the required amount of packing glands **45** that will be used during the maintenance procedure on the support rod **40**. The gland cap **97** is removed from the stuffing box **99** and moved in an upward direction along the polished rod **98**. The user engages the hook **60** and moves laterally towards the mounting ring **70** so as to allow the third member **63** of the hook **60** to engage the gland cap **97**. The hook **60** functions to suspend the gland cap **97** on the polished rod **98** above the stuffing box **99** in order to allow the user to access the used packing gland **96** that needs to be replaced. The user can perform maintenance on the stuffing box **99** while the hook **60** suspends any disassembled elements of the stuffing box **99** up and away from the user so as to reduce the interference of the elements during the maintenance procedure. Upon replacement of the used packing material **96**, the user will disengage the gland cap **97** from the hook **60** and slide the gland cap **97** down the polished rod **98** to reassemble the stuffing box **99**.

In the preceding detailed description, reference has been made to the accompanying drawings that form a part hereof, and in which are shown by way of illustration specific embodiments in which the invention may be practiced. These embodiments, and certain variants thereof, have been described in sufficient detail to enable those skilled in the art to practice the invention. It is to be understood that other suitable embodiments may be utilized and that logical changes may be made without departing from the spirit or scope of the invention. The description may omit certain information known to those skilled in the art. The preceding detailed description is, therefore, not intended to be limited to the specific forms set forth herein, but on the contrary, it is intended to cover such alternatives, modifications, and equivalents, as can be reasonably included within the spirit and scope of the appended claims.

What is claimed is:

1. A maintenance assistance device configured to releasably secure at least one hand tool and at least one maintenance item proximate a work area comprising:

a body, said body being generally planar in manner having rounded corners, said body having a first end and a second end;

a mounting ring, said mounting ring being generally annular in shape, said mounting ring being contiguous with said first end of said body, said mounting ring having an orifice, said mounting ring configured to releasably secure the device to a cylindrical shaped object;

a first aperture, said first aperture being generally oval in shape, said first aperture being proximate said first end of said body;

a second aperture, said second aperture being generally annular in shape, said second aperture proximate said second end of said body, said second aperture configured to receive a portion of a hand tool therein.

2. The device as recited in claim **1**, and further including a hook, said hook being journaled through said first aperture, said hook extending in a generally downward direction, said hook operable to engage an item surroundably mounted to the cylindrical shaped object journaled through said orifice wherein the item is below the device.

3. The device as recited in claim **2**, wherein said mounting ring further includes an opening, said opening for allowing the cylindrical shaped object to be laterally coupled to the device.

4. The device as recited in claim **3**, and further including a fastener, said fastener rotatably coupled to said mounting ring, said fastener configured to engage the cylindrical shaped object disposed within said orifice so as to releasably secure the device thereto, said fastener further including a tip, said tip configured to prevent damage to the cylindrical shaped object.

5. The device as recited in claim **4**, and further including a support rod, said support rod mounted to said body proximate said second end, said support rod extending upward from said body, said support rod for receiving thereon at least one maintenance item wherein the maintenance item is configured with an aperture.

6. The device as recited in claim **5**, and further including a keeper, said keeper being integrally mounted to said body proximate said second end, said keeper being arcuate in shape, said keeper configured to receive at least one hand tool thereon.

7. A stuffing box maintenance device comprising:

a body, said body being generally planar in manner, said body having a first end and a second end, said body further including a slot, said slot being generally oval in shape, said slot proximate said first end;

a support rod, said support rod being mounted to said body, said support rod being proximate said second end of said body, said support rod extending upward from said body and being generally perpendicular therewith, said support rod operable to receive at least on packing gland thereon;

a mounting ring, said mounting ring contiguous with said body, said mounting ring being formed proximate said first end, said mounting ring being annular in shape and having an orifice, said orifice configured to receive a polished rod therein, and

wherein the stuffing box maintenance device is configured to be releasably secured to a polished rod generally above a stuffing box engaged therewith.

8. The stuffing box maintenance device as recited in claim **7**, wherein said mounting ring further includes an opening, said opening located on said mounting ring opposite said body, said opening configured to receive a polished rod therethrough in a generally lateral direction in order to allow said mounting ring to be surroundably mounted to the polished rod.

9. The stuffing box maintenance device as recited in claim **8**, and further including a hook, said hook journaled through said slot, said hook extending in a generally downward direction from said body, said hook operable to engage at least one

element of the stuffing box subsequent the stuffing box being disassembled for maintenance.

10. The stuffing box maintenance device as recited in claim **9**, and further including a fastener, said fastener being operably coupled to said mounting ring, said fastener configured to engage the polished rod located in said orifice, said fastener further including a tip, said tip being manufactured from plastic so as to substantially prevent scratching of the polished rod, said fastener for releasably securing the stuffing box maintenance device to the polished rod above the stuffing box.

11. The stuffing box maintenance device as recited in claim **10**, and further including a keeper, said keeper secured to said second end of said body, said keeper extending in a generally downward direction, said keeper being generally hook-shaped, said keeper configured to support a hand tool having an aperture thereon.

12. The stuffing box maintenance device as recited in claim **11**, and further including an aperture, said aperture being journaled through said body, said aperture being intermediate said support rod and said slot, said aperture configured to receive therein and releasably secure a hand tool.

13. A stuffing box maintenance device operable to engage a polished rod proximate to a stuffing box wherein the stuffing box maintenance device is generally above the stuffing box comprising:

a body, said body being planar in manner, said body having a first end and a second end, said body having a first aperture, said first aperture being oval in shape, said first aperture being proximate said first end;

a mounting ring, said mounting ring being secured to said first end of said body, said mounting ring having one wall being generally annular in shape, said mounting ring having an orifice sufficient in size to receive therein the polished rod, said mounting ring being configured to surroundably mount the polished rod,

an opening, said opening located in said one wall of said mounting ring opposite said body, said opening configured to allow the stuffing box maintenance device to be laterally coupled to the polished rod, and

a hook, said hook journaled through said slot first aperture, said hook extending in a generally downward direction from said body, said hook further including a top member, said top member configured to maintain said hook within said first aperture, said hook operable to engage at least one element of the stuffing box subsequent the stuffing box being disassembled for maintenance;

a support rod, said support rod mounted to the upper surface of said body, said support rod extending upward from said body, said support rod operable to releasably secure a plurality of packing glands;

a second aperture, said second aperture being annular in shape, said second aperture being proximate said second end of said body, said second aperture operable to receive a portion of a hand tool therein.

14. The stuffing box maintenance device as recited in claim **13**, and further including a fastener, said fastener being operably coupled to said mounting ring, said fastener configured to engage the polished rod located in said orifice, said fastener further having a first end and a second end, said first end configured as an interface for a user to rotate said fastener, said second end further including a tip, said tip being manufactured from plastic, said tip configured to substantially inhibit damage to the polished rod, said fastener for releasably securing the stuffing box maintenance device to the polished rod above the stuffing box.

15. The stuffing box maintenance device as recited in claim **14**, and further including a keeper, said keeper secured to said second end of said body, said keeper extending in a generally downward direction, said keeper being generally hook-shaped, said keeper configured to support an adjustable crescent wrench having an aperture.

16. The stuffing box maintenance device as recited in claim **15**, wherein said mounting ring is configured to be releasably secured to a polished rod of at least one of the following sizes: one and a half inch or one and a quarter inch.

* * * * *